Gtbw NOT IN DATABASE
435-e ex
545.2
Yc

UNITED STATES DEPARTMENT OF AGRICULTURE

BUREAU OF ENTOMOLOGY AND PLANT QUARANTINE

FOREST INSECT INVESTIGATIONS

MEMORANDUM TO SUPERVISOR - SIERRA NATIONAL FOREST, RE-EXAMINATION OF MEDICATED POLE STOCK. RECENT DATA TO SUPPLEMENT MEMORANDUM OF June 23, 1937

by
J. E. Patterson
Berkeley, California
September 23, 1937

U. S. GOVERNMENT PRINTING OFFICE 60918

Forest Insect Laboratory
Berkeley, California
September 23, 1937

MEMORANDUM TO SUPERVISOR - SIERRA NATIONAL FOREST, RE-EXAMINATION OF MEDICATED POLE STOCK. RECENT DATA TO SUPPLEMENT MEMORANDUM OF June 23, 1937

APPROVED BY:

J. M. MILLER
Senior Entomologist, in Charge

SUBMITTED BY:

J. E. Patterson

J. E. PATTERSON
Assistant Entomologist

MEMORANDUM TO SUPERVISOR - SIERRA NATIONAL FOREST, RE-EXAMINATION OF MEDICATED POLE STOCK. RECENT DATA TO SUPPLEMENT MEMORANDUM OF JUNE 23, 1937.

During the process of medicating pole stock, for use as rustic lamp posts at the Forest Headquarters, several examples of each test were left in the woods to serve as checks for the treated material. The stock was treated May 13-15, 1937 and the checks have remained at the site of the operations (on the hill road between Goat Mountain and Oakhurst) since that time. No parts of the check stock were used for any other purpose. An 8 foot basal section of each check tree was planted upright in the ground in a manner identical to the erection of fence posts, with at least 6 feet exposed above the ground. The lopped tops were left lying on the ground surface but all limbs and foliage was piled and burned.

These checks were re-examined August 26, 1937. They had been exposed to insect attack for a period of approximately three months during the season of greatest insect activity which is considered sufficiently long to insure attack unless rendered immune by the treatment.

Detailed results of the check examination are given in the following table:

Check symbol	Tree species Chemical	Condition on August 26, 1937.
BEIP	Ponderosa pine Untreated	Fully attacked by Melanophila gentilis and Ips. sp.
BEIC	Incense cedar Untreated	Fully attacked by Phloeosinus sp. Sapwood and phloem green.
BEA 1	Ponderosa pine Sod. Arsenite 1#	Upper end of top lightly attacked by Ips sp. Stub dried but not attacked.
BEA 1	Incense cedar Sod. arsenite 1#	Check stub dried but not attacked. Cut-off top fully attacked by Melanophila and Semanotus sps.
BEA 2	Ponderosa pine Sod. arsenite 2#	Phloem of stub dry, not attacked. Lopped top lightly attacked on one side by Ips sp.
BEA 2	Incense cedar Sod. arsenite 2#	Check stub lightly attacked on one side by Melanophila. Phloem dry. Heavier attack by Melanophila on Lopped top.

Check symbol	Tree species Chemical	Condition on August 26, 1937.
BEB 1	Ponderosa pine Copper sulph. 1#	Phloem of check stub and lopped top dry. No insect attacks on either.
BEB 1	Incense cedar Copper sulph. 1#	Phloem of both stub and top dry. No attack on stub. Extreme tip of top attacked by Melanophila. No indication of copper stain in attacked section.
BEB 2	Ponderosa pine Copper sulph. 2#	Phloem of stub dry. Not attacked. Phloem of top green but not attacked.
BEB 2	Incense cedar Copper sulph. 2#	Phloem of stub green. Not attacked. Top dry. Attacked by Cerambycids and flatheads.
BEC 1	Ponderosa pine Zinc chloride 1#	Phloem of stub dry. Light attack by Orthotomicus sp. on one side.
BEC 1	Incense cedar Zinc chloride 1#	Phloem of stub dry. Light attack of Phloeosinus in narrow strip on one side. Attack failed without brood development. Top dry and unattacked.
BEC 2	Ponderosa pine Zinc chloride 2#	Phloem of both stub and top dry. Neither attacked.
BEC 2	Incense cedar Zinc chloride 2#	Phloem of both stub and top dry, with brown and withered appearance. Neither attacked by insects.

The results of these tests indicate the following conclusions:

1. All three chemical substances used were effective to an extent in preventing insect attack.

2. The extent of effectiveness seems to be governed by the completeness of dissemination through the phloem and sapwood. All parts reached by the chemical solutions were rendered immune to attack.

3. Of the three chemicals used, sulphate of copper gave the best and most consistent results. It is completely soluble in water at ordinary temperatures, a property of real value in field use. Other attributes are its rapid dissemination throughout the phloem and sapwood, and its dispersion may be traced by the characteristic bluish stain. Its low poison index to mammals is a quality highly desirable for use on rustic work.

4. Zinc chloride followed copper sulphate in effectiveness but was more messy to use and dissemination was not as uniform.

5. Sodium arsenite was least effective. Fair immunity was secured where the chemical reached but dissemination was not uniform and patchy dispersion resulted. It has the disadvantage of being highly poisonous and for this reason alone is not to be recommended for treating rustic work. Since neither zinc chloride nor sodium arsenite leave a stain it is difficult to trace dispersion through the treated stock.

6. In nearly every case partial to complete saturation of the basal section sufficient to prevent attack was secured. At the same time the top portions of adequately protected corresponding basal sections were attacked. It is evident in these cases that an insufficient amount of solution was used to satisfactorily treat the entire tree. This was at once visible in trees treated with copper sulphate. Beyond the stained portion which marked the limit of ascension of the copper solution, infestation began but was not present on the stained portion.

7. The maximum dosage used in these treatments was 2 pounds of dry chemical dissolved in 2 gallons of water. The largest trees treated were 12 inches in diameter at root collar and about 40 feet in height. Results of treatment show that the amount of solution was insufficient to saturate the phloem and sapwood for this total length; although it was adequate in treating the lower trunk which was the part of stock intended to use. Two gallons of solution satisfactorily treated the first 12 to 15 feet. At this rate about 5 gallons would be required to thoroughly treat the entire bole. The amount of chemical used, which was in the ratio of 1 pound to 1 gallon of water, appears to be satisfactory. A higher concentration would result in crystalization should the temperature drop to 60 degrees F. or lower. The results secured indicate that effective treatment may be had by using a formula of 1 pound of dry chemical in 1 gallon of water for each 10 lineal feet of stock of 10 to 14 inches diameter at collar.

8. The bark had not loosened on any portion of the stock which had been saturated with the chemicals. In most cases the phloem and sapwood had dried so that subsequent loosening of the bark and stem checking is not expected.

9. There was no indication of development of fungi although sufficient time had not elapsed for positive determination.

10. The check stubs are being maintained under forest conditions for future examinations which should reveal attacks by

wood boring species, and possible development of fungi in the sapwood.

J. E. Patterson,
Assistant Entomologist.

Berkeley, California.
September 15, 1937.